PRODUCT PERFORMANCE STUDY REVIEW

By Kevin J. Sweeney, Senior Entomologist - IB

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6/11/2007

To: Linda DeLuise

Date: June 11, 2007

EPA Reg. No. or File Symbol: 39039-8

Product Name: Gardstar 40% EC Livestock and Premise Insecticide

Registrant: Y-Tex Corporation

PM: George LaRocca, PM 13

Dec 375108

DP: D337439

PRIA Action Code: R34

PRIA Due Date: July 6, 2007

Chemical: 40% Permethrin

Type: Insecticide concentrate for a variety of indoor and outdoor agricultural uses.

Application rate: Proposed 5.6 – 6.3 gallons per 100 square feet. For soil drench and 1 gallon per 750-1000 square feet for pallet treatment.

Pests: many public health pests. This submission requests preventive claims for Imported Fire Ants attempting to invade bee hives.

Sites: Soil and supporting pallets adjacent to honey bee hives.

OPPTS Product Performance Guideline: 810.35

Submitted Study:

MRID 47060501 Efficacy of Gardstar 40% EC Livestock and Premise Insecticide when used to Prevent Red Imported Fire Ant Infestations of Honey Bee Support Structures and the Associated Impact Treatment to Honey Bees.

Purposes: 1) To determine the efficacy of residual permethrin treatments made to soil and supporting wood pallets adjacent to honey bee hives against Red Imported Fire ant invasion. 2) To determine if the preventive treatments adversely affect honey bee hives or not.

Methods:

The soil and pallet treatment studies against Red Imported Fire Ants were conducted by the USDA-APHIS in Gulfport, Mississippi.

Soil Treatments.
2003. Soil areas adjacent (below) to honey bee hives were treated in 2003 with a 0.1% permethrin dilution (from the subject product) at the rate of 6 gallons of finished solution per 100 square feet. In this test there were an equal number of control and treated hives (n = 4). The number of honey bee hives infested with Red Imported Fire ants (RIFA) was recorded.

2004. The soil treatment was tested again but at two different dilutions, 0.05% and 0.1% permethrin, both applied at the rate of 6 gallons of finished solution per 100 square feet. In this test there were an equal number of control and treated hives (n = 5). The number of honey bee hives infested with Red Imported fire ants was recorded.

In both years treatment success was determined by inspecting the hives in the control and treated areas. If RIFA infested the protected hives, the treatment was identified as a failure. If they did not infest the hive, the treatment was a success.

Supporting Wood Pallet Treatments: Commercial honey bee hives are commonly mounted on wood pallets to keep them off the ground and to enable bee keepers to move the hives onto trucks for transport for site to site. In 2003 a 0.1% permethrin dilution was applied at the rate of 0.5 to 0.7 gallons per pallet supporting honey bee hives to determine if such a treatment could prevent RIFA from invading honey bee hives. In this test there were an equal number of control and treated hives (n = 5). The number of honey bee hives infested with RIFA was recorded.

Treatment success was determined by inspecting the hives in the control and treated areas. If RIFA infested the protected hives, the treatment was identified as a failure. If they did not infest the hive, the treatment was a success.

Adverse Impact on Honey bees and their Hives. The honey bee effect research was conducted in Tucson, Arizona by USDA—ARS. The hives discussed in this section are not the same hives evaluated during the RIFA tests.

Dead bee traps and entrance counts were used to monitor bee mortality and hive health. The number of test replicates per treatment was fewer than listed above for the RIFA treatments. In the Arizona tests there were two control, two pallet and two soil treatments each consisting of two replicates. The tests in Arizona were conducted in 2003 and 2004. Evaluations were made in

the spring and fall. The application rate was 0.5 to 07 gallons of the 0.1% permethrin dilution per wood pallet or 6 gallons of the 0.1 % dilution per 100 square feet of soil.

Results:

Soil Treatment. In 2003, the 0.1% permethrin dilution applied at 6 gallons per 100 square feet protected honey bee hives for at least 6 weeks. Control treatments had an infestation rate of 0 to 100% depending on the week of evaluation. In 2004, the 0.05% permethrin dilution provided 4 weeks of protection while the 0.1% permethrin dilution provided 6 weeks protection. Both dilutions were applied at 6 gallons per 1000 square feet.

Wood Pallet Treatment. In 2003 the 0.1 % permethrin dilution provided 6 weeks control.

Adverse Effects on Honey Bees. The difference between control and treatment replicates did not differ significantly in these tests except for one of the pallet treatments made in 2003. In this treatment there appears to have been a permethrin treated effect. The researchers concluded that the mortality did occur but not at a level capable of affecting colony health. However, it is unclear why this treatment resulted in an adverse effect.

Conclusions:

When diluted to 0.05% permethrin a.i. and applied to soil at the rate of 6 gallons per 100 square feet, the subject product provided honey bee hives with 4 weeks of protection against RIFA.

When diluted to 0.1% permethrin a.i. and applied to the soil at the rate of 6 gallons per 100 square feet, the subject product provided honey bee hives with 6 weeks of protection against RIFA.

When diluted to 0.1% permethrin a.i. and applied to supporting wood pallets at the rate of 0.5 – 0.7 gallons per pallet, the subject product provided honey bee hives with 6 weeks of protection against RIFA. The registrant should explain the conversion from pallet size to square feet on their label.

Application of the subject product at a dilution of 0.1% permethrin or less does not appear to have a significant adverse effect on honey bees. However, precautionary language must be on the label. A reapplication interval should also be stated. The one piece of information missing from this report is what might happen to honey bee hives if pallets are retreated every 6 weeks. The study did not evaluate how long a 0.1% wood pallet treatment lasted because the study ended after 6 weeks. The USDA-ARS did not examine the effect of pallet re-treatment on honey bee hives. Based on the label directions, it is assumed that a pallet is used throughout the season to transport honey bee hives on trucks.

Entomologist's Recommendations:

1. The subject label is acceptable provided:

a. The registrant should state a re-application interval on the label for pallet and soil treatments. (Re-treatment of a pallet is likely each season while re-treatment of soil may or may not take place depending on needs of the commercial bee keeper.)

b. The application rate for a 0.05% permethrin treatment should be changed to 6 gallons per 100 square feet or 1 gallon per 16.5 square feet tested in the submitted study.

c. The pallet treatment should indicate that approximate fraction of a gallon of finished dilution usually required to treat the bottom of one four square foot pallet. The label should also state approximately how many four square foot pallets consist of a treatment area of 750 to 1,000 square feet stated on the label.

Other comments:

In order to be more protective of bees, the proposed label recommends that only the bottom of each pallet be treated to prevent IFA invasion. This is likely to be efficacious given that the label recommends that soil and pallet treatments be made concurrently to provide protection against fire ants.